

1 CPU UPGRADING ADAPTER FOR  
2 A MICROSOFT XBOX™ GAME MACHINE

3 BACKGROUND OF THE INVENTION

4 1. Field of the Invention

5 The present invention relates to a CPU upgrading adapter with multiple  
6 operating frequency selections, and more particularly to a CPU upgrading  
7 adapter that is adapted for a Microsoft© Xbox™ game machine.

8 2. Description of Related Art

9 Microsoft™ has developed a game machine called XBOX™ that has a  
10 console for connecting to a monitor or the like by means of a special cable. In the  
11 XBOX™ game machine, a Mobile Pentium-III™ 733 MHz CPU (Coppermine  
12 Core, Micro-BGA packet, 128KB L2-Cache and 495 pins) designed by Intel© is  
13 applied as the data processing core.

14 The performance of the XBOX™ game machine basically depends on the  
15 operating frequency of the CPU. However, in the situation where the game  
16 machine executes the 3D game software, the 733MHz CPU is unable to quickly  
17 process such a great quantity of data.

18 To mitigate and/or obviate the aforementioned problem, the present  
19 invention provides a novel CPU upgrading adapter with multiple frequency  
20 selections to allow a high operating frequency CPU to be applied to an existing  
21 XBOX™ game machine.

22 SUMMARY OF THE INVENTION

23 One objective of the present invention is to provide a CPU upgrading  
24 adapter with multiple frequency selection adapted for an upgrading CPU.

1 To accomplish the objective, the CPU upgrading adapter in accordance with  
2 the present invention comprises:

3 a socket frame having a top surface in which a plurality of conductive holes  
4 are defined to correspondingly receive an upgrading CPU and having a bottom  
5 surface from which a plurality of pins extends downwardly;

6 a circuit board having a top surface to electrically connect to said plurality  
7 of pins and having a bottom surface on which multiple conductive bulbs are  
8 mounted to electrically connect to a motherboard of an XBOX™ game machine;  
9 and

10 a switch connected to the circuit board, wherein the operating frequency of  
11 the upgrading CPU is able to be adjusted by controlling the switch.

12 Other objects, advantages and novel features of the invention will become  
13 more apparent from the following detailed description when taken in  
14 conjunction with the accompanying drawings.

#### 15 BRIEF DESCRIPTION OF THE DRAWINGS

16 Fig. 1 is a schematic view showing the CPU upgrading adapter in  
17 accordance with the present invention is mounted on a motherboard of an XBOX  
18 game machine;

19 Fig. 2 is an exploded perspective view of the CPU upgrading adapter of Fig.  
20 1;

21 Fig. 3 is a plan view of a bottom surface of the CPU upgrading adapter of  
22 Fig. 1;

23 Fig. 4 is a schematic view showing the CPU upgrading adapter in  
24 accordance with the present invention is mounted on a motherboard of an XBOX

1 game machine, wherein an upgrading CPU is mounted on the upgrading adapter;  
2 and

3 Fig. 5 is a circuit diagram of the CPU upgrading adapter of the present  
4 invention;

5 Figs. 6 to 10 show the correspondingly connections between the pins of an  
6 original Intel© Mobile Pentium-III™ 733MHz CPU and the upgrading adapter  
7 of the present invention;

8 Figs. 11 and 12 show the filtering capacitors for the main power pins  
9 (VCORE) and for the sub power pins (VTT) of the present invention.

#### 10 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

11 With reference to Fig. 1, a CPU upgrading adapter in accordance with the  
12 present invention is designed to be mounted on a motherboard (100) of an  
13 XBOX game machine to receive an upgrading CPU (200) as shown in Fig. 4.  
14 The original Intel© Mobile Pentium-III™ 733MHz CPU mounted on the  
15 motherboard (100) will be detached. The upgrading CPU (200) can be chosen  
16 from a normal CPU of a desktop computer such as an Intel© Pentium-III-S™  
17 CPU, a Pentium-III™ CPU or a Celeron™ CPU. Once the original 733MHz  
18 CPU is replaced with the upgrading CPU (200), the operating frequency can  
19 reach 1400MHz. Moreover the original internal 128 KB cache memory of the  
20 733MHz CPU can be increased to 256KB or 512KB.

21 With reference to Fig. 2, the CPU upgrading adapter comprises a circuit  
22 board (10) and a socket frame (20) electrically connected to the circuit board  
23 (10). A power connector (30) and a turbo switch connector (31) are mounted on  
24 the circuit board (10). The socket frame (20) has a top surface on which multiple

1     conductive holes (21) are defined to receive pins of pins of the upgrading CPU  
2     (200), as shown in Fig. 4. A bottom surface of the socket frame (20) has a  
3     plurality of conductive pins (22) that securely and electrically connect to the  
4     circuit board (10).

5             With reference to Fig. 3, a bottom surface of the board (10) has a plurality of  
6     conductive contacts (11) formed thereon for achieving an electrical connection  
7     to the motherboard (100). These conductive contacts (11) are made of solder  
8     bulbs or similar, wherein the quantity of the conductive contacts (11) is the same  
9     as the number of pins of the original CPU of the XBOX game machine so that  
10    the upgrading adapter can be correspondingly mounted on the motherboard  
11    (100).

12            In assembly, referring to Fig. 4, the upgrading CPU (200) is firstly engaged  
13    with the socket frame (20) of the CPU escalating adapter via the plurality of the  
14    CPU pins respectively being inserted into the conductive holes (21) of the socket  
15    frame (20). Moreover, a radiating fan (not shown) can be further mounted onto  
16    the upgrading CPU (200) in a conventional manner. Finally, the upgrading  
17    adapter together with the upgrading CPU (200) is mounted on the motherboard  
18    (100).

19            As mentioned above, the operating frequency of the original CPU is  
20    733MHz, but once the new upgrading CPU (200) has replaced the original one,  
21    the highest operating frequency may reach 1400MHz. However, some software  
22    is unable to be executed by the upgrading CPU (200) with such a high operating  
23    frequency. Thus, the upgrading adapter in accordance with the present invention  
24    provides the function of operating frequency switching to meet different

1 software requirements.

2 With reference to Fig. 5, a frequency switching circuit layout on the circuit  
3 board (10) is shown. The switching circuit utilizes two logic ICs (33, 34) to  
4 output a control signal (STPCLK) to determine the operating frequency of the  
5 upgrading CPU (200). The aforementioned power connector (30) is connected to  
6 the motherboard (100) to receive a 3.3-volts voltage that is further used as the  
7 operating voltage of the two logic ICs (33, 34). The turbo switch connector (31)  
8 further connects to a switch (32).

9 For a 1400MHz upgrading CPU (200), as an example, when the switch (32)  
10 is switched to the "OPEN" status, the control signal (STPCLK) remains at a high  
11 level and the upgrading CPU (200) operates in the turbo mode, i.e. the operating  
12 frequency is maintained at 1400MHz. On the other hand, after the switch (32) is  
13 changed to the "SHORT" status, the control signal (STPCLK) becomes a  
14 sequence of clock signals with approximately 32.768KHz. While the upgrading  
15 CPU (200) receives the clock signals, the operating frequency of the CPU (200)  
16 will become a half of the original 1400MHz, i.e. approximately 700MHz. Since  
17 the 700MHz operating frequency is quite close to the 733MHz of the original  
18 Intel© Mobile Pentium-III™ CPU, software which requires a low operating  
19 frequency still can be executed with the new upgrading CPU (200).

20 With reference to Figs. 6 and 7, the signal pins of the original Intel© Mobile  
21 Pentium-III™ 733MHz CPU as shown in Fig. 6 are correspondingly to the signal  
22 pins of the socket frame (20) of the present invention as shown in Fig. 7. The  
23 main power pins (VCORE) as shown in Fig. 8 of the original Intel© Mobile  
24 Pentium-III™ 733MHz CPU are correspondingly connected to main power pins

1 of the socket frame (20) of the present invention of Fig. 9, wherein the voltage  
2 level of the VCORE is able to be adjusted to 1.5volts and then supply to the  
3 upgrading CPU (200). The secondary power pins (VTT), with a 1.5 volts voltage  
4 level, of the original Intel© Mobile Pentium-III™ 733MHz CPU shown in Fig.  
5 10 are also correspondingly connected to the socket frame (20) as shown in Fig 9.  
6 With reference to Figs. 11 and 12, the filtering capacitors for the main power pins  
7 (VCORE) and for the sub power pins (VTT) are respectively illustrated.

8 Based on the foregoing description, the upgrading adapter of the present  
9 invention allows the original Intel© Mobile Pentium-III™ 733MHz CPU to be  
10 upgraded with a high speed CPU, such as an Intel© Pentium-III-S™ CPU, a  
11 Pentium-III™ CPU or a Celeron™ CPU, to improve the software processing  
12 speed and the performance of the XBOX machine.

13 It is to be understood, however, that even though numerous characteristics  
14 and advantages of the present invention have been set forth in the foregoing  
15 description, together with details of the structure and function of the invention,  
16 the disclosure is illustrative only, and changes may be made in detail, especially  
17 in matters of shape, size, and arrangement of parts within the principles of the  
18 invention to the full extent indicated by the broad general meaning of the terms  
19 in which the appended claims are expressed.